UNITED STATES PATENT AND TRADEMARK OFFICE

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS,
WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 January 2009*.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-31* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-31* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)
2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3)☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.
5)☐ Notice of Informal Patent Application
6)☐ Other: _____.

U.S. Patent and Trademark Office
PTOL-326 (Rev. 08-06)   Office Action Summary   Part of Paper No./Mail Date 20090211

DETAILED ACTION

1.   A request for continued examination under 37 CFR 1.114, including the fee set

forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this

application is eligible for continued examination under 37 CFR 1.114, and the fee set

forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action

has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on

01/15/2009 has been entered.

2.   Claims 1-31 are pending.

Response to Arguments

3.   Applicant's arguments have been fully considered but they are unpersuasive.

4.   Applicant argues that the prior art does not teach a plurality of different types of

network traffic, each corresponds to a different network protocol. The examiner

respectfully disagrees. Boucher clearly teaches that the INIC capable of differentiating a

plurality of network protocols for fast or slow path processing (fig. 3, col. 6 lines 32-55,

hardware differentiating between fast path candidate and slow path candidates using

header bytes denoting particular protocols). Applicant further argues that each of the

protocol cited by the examiner is processed by a separate hardware logics. The

examiner respectfully disagrees. Look at fig. 6 and 9 of Boucher, one hardware logic

(e.g. hardware logic 1 in fig. 9) can differentiate whether input traffic is fast path or slow

path by determining traffic packet protocol type, not each protocol is manually input into

one hardware logic as asserted by applicant. There is also no support for applicant's

assertion in Boucher of such. In fact, Boucher uses four network lines for different

conduits, not for different protocol traffics (col. 13 lines 8-15, coaxial, twisted pair, fiber

optic...)

Claim Objections

5.   Claim 29 is objected to because of the following informalities: the claim

preamble and the claim body are indistinguishable. Appropriate correction is required.

Claim Rejections - 35 USC § 101

6.   35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or
> composition of matter, or any new and useful improvement thereof, may obtain a patent therefor,
> subject to the conditions and requirements of this title.

7.   Claims 29-31 are rejected under 35 U.S.C. 101 the claimed invention is directed

to non-statutory subject matter. A driver per se is non-statutory subject matter, since a

driver per se can just contains computer program codes.

Claim Rejections - 35 USC § 102

8.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b),
> by another filed in the United States before the invention by the applicant for patent or (2) a
> patent granted on an application for patent by another filed in the United States before the
> invention by the applicant for patent, except that an international application filed under the treaty
> defined in section 351(a) shall have the effects for purposes of this subsection of an application
> filed in the United States only if the international application designated the United States and
> was published under Article 21(2) of such treaty in the English language.

9.   Claims 1-4, 15-20, and 23 are rejected under 35 U.S.C. 102(e) as being

anticipated by Boucher et al. (US 6,226,680, hereafter Boucher).

10.   For claim 1, Boucher discloses a server, comprising:

- a network connector (fig. 13, col. 16 lines 6-12, network line 210, four network

  lines are presented for different conduits, but each of them is a media

  independent interface);

- a processor coupled to the network connector (fig. 13, microprocessor 470, col.

  16 line 62-col. 17 line 13), the processor being operable to process a plurality of

  different types of network traffic, wherein each of said plurality of different types

  of network traffic corresponds to a different network protocol (abstract, col. 3

  lines 35-67, col. 6 lines 33-55, col. 13 lines 24-35, the intelligent network

  interface card INIC's processor supports an fast path candidate traffics and slow

  path traffics by identifying input packet protocol types);

- a peripheral component interface (PCI) bridge coupled to the processor (fig. 13,

  PCI bus interface unit); and

- a unified driver coupled to the PCI bridge, the unified driver being operable to

  provide drivers associated with the plurality of different types of network traffic

  (fig. 6 and 10, PCI bridge 157 connected to protocol stack with driver, col. 14 l. 9-

  13, INIC miniport driver determines whether the traffic is fast path candidate

  offload traffic or non-fast path IP and/or Ethernet traffic).

11.   For claim 2, Boucher further discloses the network connector comprises an

Ethernet connector (fig. 13, network line 210 is an Ethernet connector).

12.   For claim 3, Boucher further discloses the plurality of different types of network

traffic comprises two or more of common Ethernet traffic, offload traffic, storage traffic,

interprocess communication (IPC) traffic, management traffic and remote direct memory

access (RDMA) traffic (abstract, col. 3 lines 35-67, col. 13 lines 24-35, the intelligent

network interface card INIC's processor supports an offload traffic protocols via fast

path and regular IP traffic protocols via a slow path, or Ethernet traffic and offload

traffic).

13.   For claim 4, Boucher further discloses the processor comprises a single

integrated chip (fig. 9, fig. 13, microprocessor).

14.   For claim 15, Boucher further discloses the processor or the PCI bridge

determines which of the different types of network traffic accesses a particular service

provided by the server (fig. 10 and 11, col. 14 l. 9-13 and 61-66, INIC miniport driver

determines whether the traffic is fast path offload traffic protocol and slow path traffic

protocol).

15.   For claim 16, the claim is rejected for the same rationale as in claim 13.

16.   For claim 17, Boucher further discloses the processor, the PCI bridge or the

unified driver provides a unified data and control path (fig. 10 and 11, col. 14 l. 9-13 and

61-66, INIC miniport driver determines whether the traffic is fast path offload traffic

protocol and slow path IP traffic protocol).

17.   For claim 18, Boucher discloses a method for network interfacing, comprising:

        handling a plurality of different types of network traffic via a layer 2 (L2)

connector (fig. 13, col. 16 lines 6-12, a network line 210 connected to a MAC controller

supporting both offload protocol traffic and slow traffic protocol);

        wherein each of said plurality of different types of network traffic corresponds to a

different network protocol (abstract, col. 3 lines 35-67, col. 6 lines 33-55, col. 13 lines

24-35, the intelligent network interface card INIC's processor supports an fast path

candidate traffics and slow path traffics by identifying input packet protocol types)

        processing the different types of network traffic in a single chip (fig. 13,

microprocessor 470, col. 16 line 62-col. 17 line 13, col. 3 lines 35-67, the INIC supports

an offload traffic via fast path and regular IP traffic via a slow path); and

        determining which of the different types of network traffic accesses software

services via a single data path (fig. 10 and 11, col. 14 l. 9-13 and 61-66, INIC miniport

driver determines whether the traffic is fast path candidate offload traffic or non-fast path

IP or Ethernet traffic, single line connecting INIC and INIC miniport driver, fig. 13, a

single PCI bus interface 257).

18.   For claim 19, Boucher further discloses the plurality of different types of network

traffic comprises two or more of common Ethernet traffic, offload traffic, storage traffic,

interprocess communication (IPC) traffic and management traffic (abstract, col. 3 lines

35-67, col. 13 lines 24-35, the intelligent network interface card INIC's processor

supports an offload traffic via fast path and regular IP traffic via a slow path, or Ethernet

traffic and offload traffic) and/or remote direct memory access (RDMA) traffic.

19.   For claim 20, Boucher further discloses the L2 connector is a single L2 connector

(fig. 13, col. 16 lines 6-12, a network line 210 connected to a MAC controller, four

network lines are presented for different conduits, but each of them is media

independent interface).

20.   For claim 23, Boucher further discloses: providing drivers associated with the

plurality of different types of network traffic via a unified driver (fig. 11 INIC miniport

driver for both offload traffic and regular IP traffic).

Claim Rejections - 35 USC § 103

21.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as
> set forth in section 102 of this title, if the differences between the subject matter sought to be
> patented and the prior art are such that the subject matter as a whole would have been obvious
> at the time the invention was made to a person having ordinary skill in the art to which said
> subject matter pertains. Patentability shall not be negatived by the manner in which the invention
> was made.

22.   Claims 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Boucher, as applied to claim 1 above, and further in view of Kistler et al. (US

2002/0198934, hereafter Kistler)

23.   For claims 10 and 11, Boucher discloses the invention as in claim 1. Boucher

does not disclose a server management agent coupled to the processor that is coupled

to a keyboard and/or video and/or mouse service.

        However, Kistler discloses the same (fig. 3 keyboard and mouse connected to an

emulator that is coupled to a NIC)

        Therefore, it would have been obvious for one skilled in the art at the time of the

invention to combine the teachings of Boucher and Kistler to provide console interaction

handling over the network (Kistler, abstract)

24.   Claims 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Boucher as applied to claim 1 above, and further in view of Microsoft (Winsock Direct

and Protocol Offload on SANs, 03/03/2001).

25.   For claim 14, Boucher does not disclose the unified driver is coupled to a

software TCP processor and to a socket service switch, wherein the software TCP

processor is coupled to the socket service switch

However, Microsoft discloses the unified driver is coupled to a software TCP processor and to a socket service switch, wherein the software TCP processor is coupled to the socket service switch (Microsoft, fig. 1, a socket switch between a TCP/IP socket provider and a SAN provider), and wherein the socket service switch is coupled to a socket service (Microsoft, fig. 1, switch coupled to socket application).

Therefore, it would have been obvious for one skilled in the art at the time of the invention to combine the teachings of Boucher and Microsoft to provide WinSock socket service switch to a TCP/IP-offload-enabled NIC card of Boucher in order to further enhance the card with more functionalities such as RDMA traffic support.

26.   For claim 12, Boucher-Microsoft discloses the invention as in claim 14. Boucher-Microsoft further discloses a plurality of services coupled to the unified driver (Microsoft, fig. 1, p. 5 lines 7-8, socket service, RDMA service).

27.   For claim 13, Boucher-Microsoft discloses the invention as in claim 14. Boucher-Microsoft further discloses the particular service comprises at least one of a socket service, a SCSI miniport service, an RDMA service and/or a keyboard and/or video and/or mouse service (Microsoft, fig. 1, p. 5 lines 7-8, socket service, RDMA service).

28.   Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Boucher, as applied to claim 18 above, and further in view of Official Notice (hereafter ON).

29.   For claim 21, the claim is rejected as in claim 18. Boucher does not disclose

employing time division multiplexing to determine which of the different types of network

traffic access the software services via the single data path.

        However, Official Notice is taken that it is well known in the art how to employ

time division multiplexing (TDM) to transmit multiple traffics over one channel in different

timeslots. Microsoft Computer Dictionary (fifth edition) defines time division multiplexing

as a form of multiplexing in which transmission time is broken into segments, each of

which carries one segment of one signal or traffic type.

        Therefore, it would have been obvious for one skilled in the art at the time of the

invention to combine the teachings of Boucher and what is well known in the art to

determine which of the different types of network traffic access the software services via

the single data path by allotting multiple traffic segments of different types over one

channel in different time slots using TDM in order to minimize cost and complexity of

building multiple channels unnecessarily.

30.   Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over

Boucher, further in view of Yang et al. (US 2002/0041566, hereafter Yang).

31.   For claim 22, the claim is rejected for the same rationale as in claim 18. Boucher

does not disclose dynamically allocating fixed resources among the different types of

network traffic.

However, Yang discloses dynamic and fixed resource allocation for time division

multiplexing (abstract)

It would have been obvious for one skilled in the art at the time of the invention to

combine the teachings of Boucher and Yang to allocate fixed resources among traffic

types to allow optimize the use of resource such as service rate while maintaining

quality of services (Yang, [0018])

32.   Claims 5-8 and 24-28 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Boucher, as applied to claim 1 above, and further in view of Hayes et al. (US

2003/0046330, hereafter Hayes)

33.   For claim 5, Boucher further discloses the processor comprises a layer 2 network

interface card (L2 NIC) (fig. 13, MAC controller 402), a transmission control protocol

(TCP) processor (fig. 9, TCP processor for offload).

Boucher does not disclose an upper layer protocol (ULP) processor;

However, Hayes discloses an upper layer protocol (ULP) processor (fig. 3,

[0017], NIC with an auxiliary processor for offloading iSCSI upper layer traffic)

Therefore, it would have been obvious for one skilled in the art at the time of the

invention to combine the teachings of Boucher and Hayes to provide ULP support for a

TCP/IP offload NIC card in order to further enhance the card with more functionalities

such as iSCSI traffic support over TCP/IP.

34.   For claim 6, Boucher-Hayes discloses the invention as in claim 5. Boucher-

Hayes further discloses the TCP processor provides layer 3 processing and layer 4

processing (fig. 9, an offload processor provides L3 IP and L4 TCP offload traffic).

35.   For claim 7, Boucher-Hayes discloses the invention as in claim 5. Boucher-

Hayes further discloses the TCP processor is shared by two or more of TCP offload

traffic (fig. 9, an offload processor provides L3 IP and L4 TCP offload traffic), Internet

small computer system interface (iSCSI) traffic (Hayes, [0017]) and RDMA traffic.

36.   For claim 8, Boucher-Hayes discloses the invention as in claim 5. Boucher-

Hayes further discloses the ULP processor provides iSCSI processing (Hayes, [0017],

[0018]).

37.   For claim 24, Boucher discloses a method for network interfacing, comprising:

        handling a plurality of different types of network traffic via a single Ethernet

connector (fig. 13, col. 16 lines 6-12, a network line 210 connected to a MAC controller

supporting both offload traffic and regular IP traffic);

        wherein each of said plurality of different types of network traffic corresponds to a

different network protocol (abstract, col. 3 lines 35-67, col. 6 lines 33-55, col. 13 lines

24-35, the intelligent network interface card INIC's processor supports an fast path

candidate traffics and slow path traffics by identifying input packet protocol types)

processing the plurality of different types of network traffic using a layer 2 (L2)

processor (fig. 13, L2 MAC controller 402), a layer 3 (L3) processor and a layer 4 (L4)

processor (fig. 9 a TCP/IP offload processor that processes L3 and L4 traffics) and

providing a unified data and control path (fig. 13 links between processor and

PCI bus interface).

Boucher does not disclose an upper layer protocol (ULP) processor;

However, Hayes discloses an upper layer protocol (ULP) processor (fig. 3,

[0017], NIC with an auxiliary processor for offloading iSCSI traffic);

Therefore, it would have been obvious for one skilled in the art at the time of the

invention to combine the teachings of Boucher and Hayes to provide ULP support for a

TCP/IP offload enabled NIC card in order to further enhance the card with more

functionalities such as iSCSI traffic support over TCP/IP.

38.   For claim 25, the claim is rejected for the same rationale as in claim 20.

39.   For claim 26, Boucher-Hayes discloses the invention as in claim 5. Boucher-

Hayes further discloses the L3 processor and the L4 processor are combined into a

single TCP processor (fig. 9, TCP offload processor 230 bypasses (L3 IP and L4 TCP)

offload traffic to upper layers (application layer...)

40.   For claim 27, the claim is rejected for the same rationale as in claim 24.

41.   For claim 28, the claim is rejected for the same rationale as in claim 23.

42.   Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Boucher-

Hayes, as applied to claim 5 above, and further in view of Microsoft.

43.   For claim 9, Boucher-Hayes discloses the invention as in claim 5. Boucher-

Hayes does not disclose the ULP processor provides RDMA processing

        However, Microsoft discloses the same (Microsoft, page 5, Remote DMA

semantics including RDMA write and read).

        Therefore, it would have been obvious for one skilled in the art at the time of the

invention to combine the teachings of Boucher-Hayes and Microsoft to provide WinSock

socket service switch between RDMA and TCP/IP in order to further enhance the card

with more functionalities such as RDMA traffic support.

44.   Claims 29-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Boucher, further in view of Callaghan (NFS over RDMA).

45.   For claim 29, Boucher discloses a unified driver embodied as a computer

program on a computer system, having at least one code section for arranging and

processing network traffic, the at least one code section executable by the computer

system for causing the computer system to perform steps comprising:

executing said at least one code section from said unified driver to handle a

plurality of different types of network traffics (fig. 6 and 10 and 13, single network

interface card INIC connected to host through a PCI bridge 157, col. 14 l. 9-13, codes

from INIC miniport driver on the INIC determines whether the traffic is fast path offload

traffic (TCP/IP for instance) and non-fast path traffic (IP, Ethernet traffic) and network

services via a single PCI bridge (fig. 13, single PCI bridge 257),

wherein each of said plurality of different types of network traffic corresponds to a

different network protocol (abstract, col. 3 lines 35-67, col. 6 lines 33-55, col. 13 lines

24-35, the intelligent network interface card INIC's processor supports an fast path

candidate traffics and slow path traffics by identifying input packet protocol types)

the network services comprise a storage service (col. 13 lines 42-45, large file

transfer service using fast path or SMB over TCP/IP). Boucher also discloses a DMA

controller for direct memory access to the host system cache (col. 13 lines 53-58).

Boucher does not explicitly disclose a socket service, RDMA service or

keyboard/video/mouse service.

However, Callaghan discloses a storage service and a RDMA service (section 2

and 6, network file system service (NFS) and RDMA service using hardware, section 7)

It would have been obvious for one skilled in the art at the time of the invention to

combine the teachings of Boucher and Callaghan to implement NFS over RDMA to

make full and efficient use of gigabit network (Callaghan, first par.)

46.   For claim 30, Boucher-Callaghan further discloses coupling said single PCI

bridge to an integrated chip to concurrently process a plurality of network traffics

(Boucher, fig. 10, 11, 13, INIC card coupled to PCI bridge).

47.   For claim 31, Boucher-Callaghan further discloses said plurality of network

traffics comprise two or more of offload traffic (Boucher, col. 6 lines 39-55, TCP/IP

processed by the processor on the network interface card (INIC) is offload traffic),

storage traffic (Boucher, col. 13 lines 42-45, large file transfer service using fast path or

SMB over TCP/IP), interprocess communication (IPC) traffic, management traffic and/or

remote direct memory access (RDMA) traffic.

Conclusion

48.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Hieu T. Hoang whose telephone number is 571-270-

1253. The examiner can normally be reached on Monday-Thursday, 8 a.m.-5 p.m.,

EST.

       If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, John Follansbee can be reached on 571-272-3964. The fax phone number

for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

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HH

/Kenny S Lin/

Primary Examiner, Art Unit 2452